In the Claims:

Please amend the Claims as follows:

1. (Canceled)

2. (Currently Amended) A method as defined in Claim 1 A method for brightness and contrast normalization in appearance-based object detection, the method comprising:

extracting a plurality of training images;

finding eigenimages corresponding to the training images;

receiving an input image;

forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters;

computing projected and normalized images;

computing an error-of-fit of the projected and normalized images;

thresholding the error-of-fit; and

determining object positions in accordance with the thresholded error-of-fit,

wherein finding eigenimages comprises:

sub-sampling the training images;

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forming training images of coarse resolution in accordance with the

sub-sampled images;

computing eigenimages corresponding to the training images of

coarse resolution;

interpolating the eigenimages for coarse resolution;

performing orthonormalization on the interpolated images by

singular value decomposition; and

providing pseudo-eigenimages corresponding to the

orthonormalized images for a finer resolution.

3. (Currently Amended) A method as defined in ~~Claim 1~~ Claim 2 wherein

at least one of said plurality of training images and said input image comprises a

single-photon emission computed tomography image.

4. (Currently Amended) A method as defined in ~~Claim 1~~ Claim 2 wherein

the computed error-of-fit is represented by a score image.

5. (Currently Amended) ~~A method as defined in Claim 1~~ A method for

brightness and contrast normalization in appearance-based object detection, the

method comprising:

extracting a plurality of training images;

finding eigenimages corresponding to the training images;

receiving an input image;

forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters;

computing projected and normalized images;

computing an error-of-fit of the projected and normalized images;

thresholding the error-of-fit; and

determining object positions in accordance with the thresholded error-of-fit,

further comprising forming eigenimages for multiresolution, including:

sub-sampling a plurality of training images;

forming training images of coarse resolution in accordance with the sub-sampled images;

computing coarse eigenimages corresponding to the training images of coarse resolution;

interpolating the coarse eigenimages for a finer resolution;

orthonormalizing the interpolated images; and

providing pseudo-eigenimages corresponding to the orthonormalized images for a finer resolution,

wherein the pseudo-eigenimages are formed with a projection equation responsive to the coarse eigenimages by adding a scaling and a shift to image intensity.

6. (Original) A method as defined in Claim 5 wherein orthonormalizing the interpolated images comprises performing a singular value decomposition.

7-12. (Canceled)

13. (Currently Amended) ~~A system as defined in Claim 12~~ A system for brightness and contrast normalization in appearance-based object detection, the system comprising:

extraction means for extracting a plurality of training images;

finding means for finding eigenimages corresponding to the training images;

receiving means for receiving an input image;

forming/solving means for forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters;

computing means for computing projected and normalized images;

fitting means for computing an error-of-fit of the projected and normalized images;

thresholding means for thresholding the error-of-fit; and

determining means for determining object positions in accordance with the thresholded error-of-fit,

wherein said finding means comprises:

sub-sampling means for sub-sampling the training images;

training means for forming training images of coarse resolution in accordance with the sub-sampled images;

eigenimaging means for computing eigenimages corresponding to the training images of coarse resolution;

interpolating means for interpolating the eigenimages for coarse resolution;

orthonormalization means for performing orthonormalization on the interpolated images by singular value decomposition; and

pseudo-eigenimaging means for providing pseudo-eigenimages corresponding to the orthonormalized images for a finer resolution.

14. (Currently Amended) A system as defined in ~~Claim 12~~ Claim 13 wherein at least one of said plurality of training images and said input image comprises a single-photon emission computed tomography image.

15. (Currently Amended) A system as defined in ~~Claim 12~~ Claim 13 wherein the computed error-of-fit is represented by a score image.

16. (Currently Amended) ~~A system as defined in Claim 12, further comprising~~ A system for brightness and contrast normalization in appearance-

based object detection, the system comprising:

extraction means for extracting a plurality of training images;

finding means for finding eigenimages corresponding to the training
images;

receiving means for receiving an input image;

forming/solving means for forming a projection equation responsive to the
eigenimages by adding a scaling and a shift to image intensity and
simultaneously solving for intensity normalization parameters;

computing means for computing projected and normalized images;

fitting means for computing an error-of-fit of the projected and normalized
images;

thresholding means for thresholding the error-of-fit; and

determining means for determining object positions in accordance with the
thresholded error-of-fit;

means for forming eigenimages for multiresolution, including:

sub-sampling means for sub-sampling a plurality of training images;

training means for forming training images of coarse resolution in
accordance with the sub-sampled images;

eigenimaging means for computing coarse eigenimages
corresponding to the training images of coarse resolution;

interpolating means for interpolating the coarse eigenimages for a
finer resolution;

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orthonormalizing means for orthonormalizing the interpolated

images; and

pseudo-eigenimaging means for providing pseudo-eigenimages

corresponding to the orthonormalized images for a finer resolution,

wherein the pseudo-eigenimages are formed with a projection

equation responsive to the coarse eigenimages by adding a scaling and a

shift to image intensity.

17. (Original) A system as defined in Claim 16 wherein said

orthonormalizing means comprises decomposition means for performing a

singular value decomposition.

18. (Canceled)

19. (Currently Amended) ~~A program storage device as defined in Claim 18~~

<u>A program storage device readable by machine, tangibly embodying a program</u>

<u>of instructions executable by the machine to perform method steps for brightness</u>

<u>and contrast normalization in appearance-based object detection, the method</u>

<u>steps comprising:</u>

<u>extracting a plurality of training images;</u>

<u>finding eigenimages corresponding to the training images;</u>

<u>receiving an input image;</u>

forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters;

computing projected and normalized images;

computing an error-of-fit of the projected and normalized images;

thresholding the error-of-fit; and

determining object positions in accordance with the thresholded error-of-fit,

wherein the program step of finding eigenimages comprises:

sub-sampling the training images;

forming training images of coarse resolution in accordance with the sub-sampled images;

computing eigenimages corresponding to the training images of coarse resolution;

interpolating the eigenimages for coarse resolution;

performing orthonormalization on the interpolated images by singular value decomposition; and

providing pseudo-eigenimages corresponding to the orthonormalized images for a finer resolution.

20. (Currently Amended) A program storage device as defined in ~~Claim 18~~ Claim 19 wherein at least one of said plurality of training images and said input

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image comprises a single-photon emission computed tomography image.

21. (Currently Amended) A program storage device as defined in ~~Claim 18~~ Claim 19 wherein the computed error-of-fit is represented by a score image.

22. (Currently Amended) ~~A program storage device as defined in Claim 18,~~ A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for brightness and contrast normalization in appearance-based object detection, the method steps comprising:

extracting a plurality of training images;

finding eigenimages corresponding to the training images;

receiving an input image;

forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters;

computing projected and normalized images;

computing an error-of-fit of the projected and normalized images;

thresholding the error-of-fit; and

determining object positions in accordance with the thresholded error-of-fit,

further comprising method steps for forming eigenimages for

multiresolution, including:

sub-sampling a plurality of training images;

forming training images of coarse resolution in accordance with the sub-sampled images;

computing coarse eigenimages corresponding to the training images of coarse resolution;

interpolating the coarse eigenimages for a finer resolution;

orthonormalizing the interpolated images; and

providing pseudo-eigenimages corresponding to the orthonormalized images for a finer resolution,

wherein the pseudo-eigenimages are formed with a projection equation responsive to the coarse eigenimages by adding a scaling and a shift to image intensity.

23. (Original) A program storage device as defined in Claim 22 wherein the program step of orthonormalizing the interpolated images comprises performing a singular value decomposition.